



# LOWER DUWAMISH WATERWAY UPDATES ON EARLY ACTION AREAS

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

NOVEMBER 18, 2014

# Early Action Updates & Additional Studies

- ▶ Boeing Plant 2 update (Melissa Blankenship)
- ▶ Jorgensen Forge (Becky Chu)
- ▶ Updates on other early actions (Julie Congdon)
- ▶ Brief update on activated carbon pilot study (Kristen Kerns)
- ▶ Fishers Study (Becky Chu)
- ▶ Questions



# EMJ Removal Action

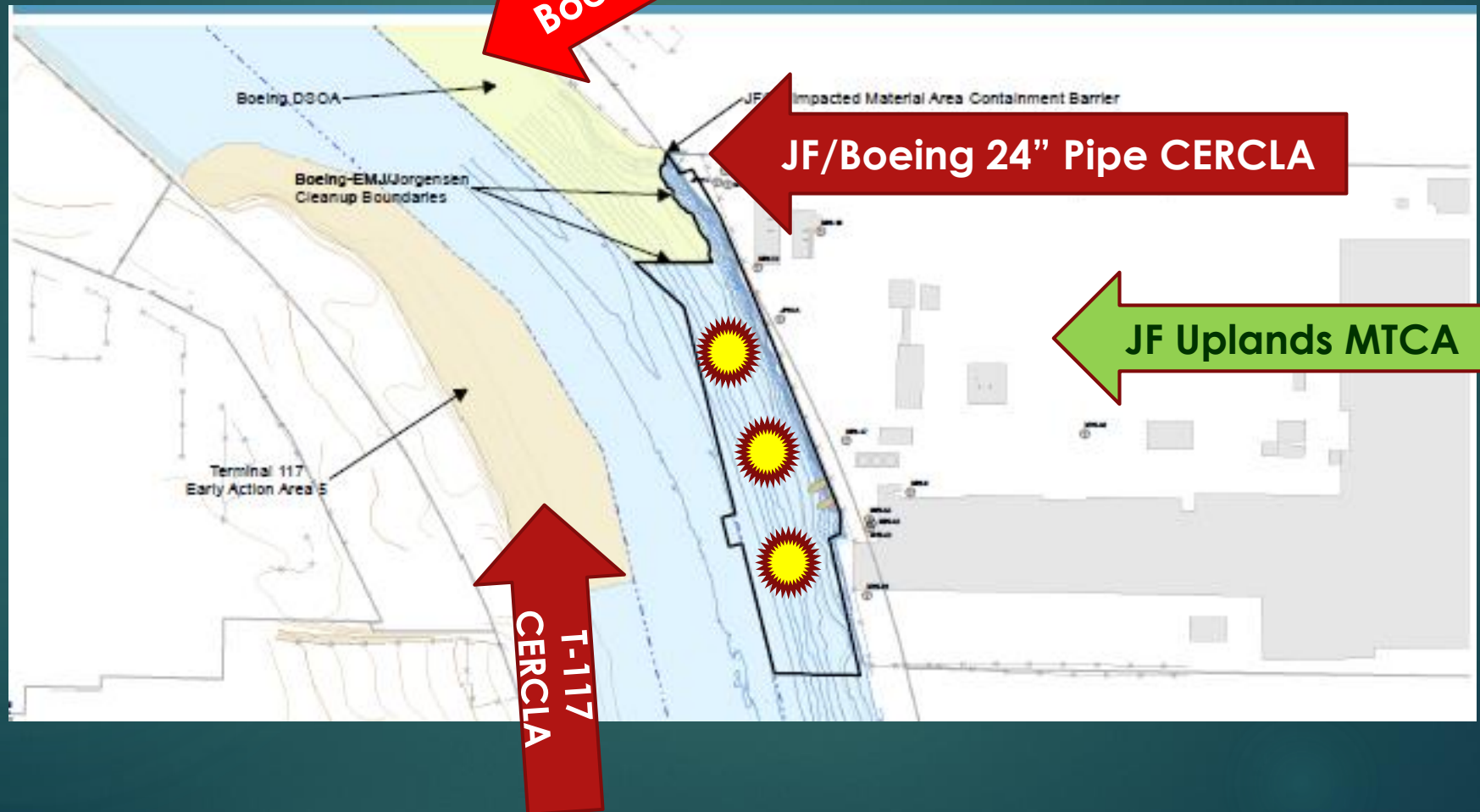
LESSONS LEARNED

# EMJ Background

- ▶ EAA of the LDW- with Boeing Plant 2
- ▶ PRP-led NTCRA (started: 2003; EECA 2008-2011; Removal Order: 2012)
- ▶ Metal Foundry (formerly Bethlehem Steel)
- ▶ Primary COCs: Co-located PCBs and metals (As, Cd, Cr, Cu, Pb, Hg, Ag, Zn)
- ▶ Sediment site: ~12000 yds<sup>3</sup> sediment, 3000 yds<sup>3</sup> bank
- ▶ Uplands is Ecology MTCA site
- ▶ “24” Pipe” runs along the northern property line with Boeing Plant 2



# EMJ Background



# EMJ Project Timeline:

## CERCLA Non-Time Critical Removal Action



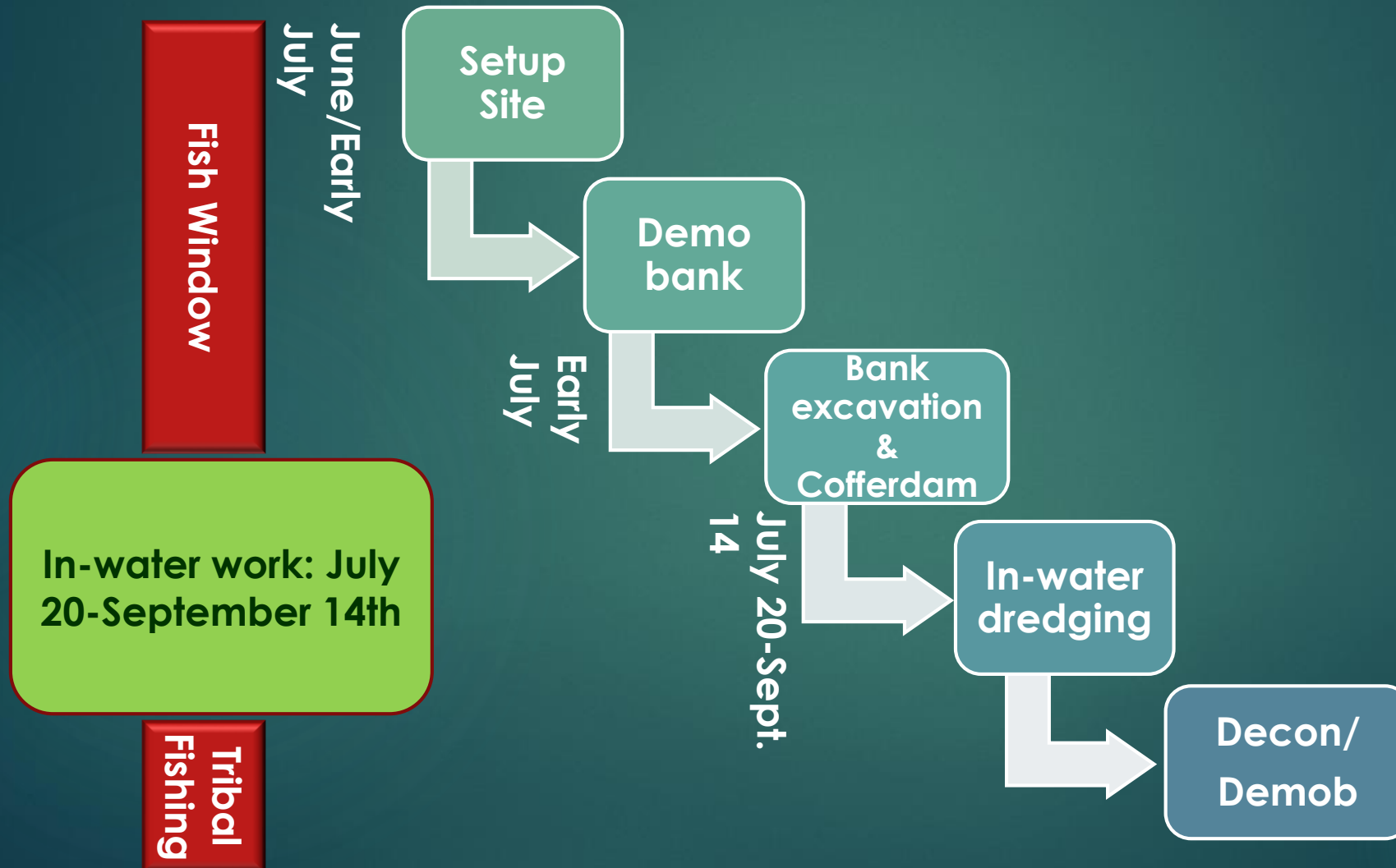
# EPA's Action Memorandum

- ▶ Complete excavation of all bank and sediments within EAA exceeding RvALs;
- ▶ Stormwater Management;
- ▶ Long-term sediment and groundwater monitoring.

COC	RvAL (mg/kg)
PCBs	12 ppm OC
Cadmium	5.1
Lead	450
Chromium	390
Mercury	0.41
Silver	6.1
Zinc	410
Arsenic	51



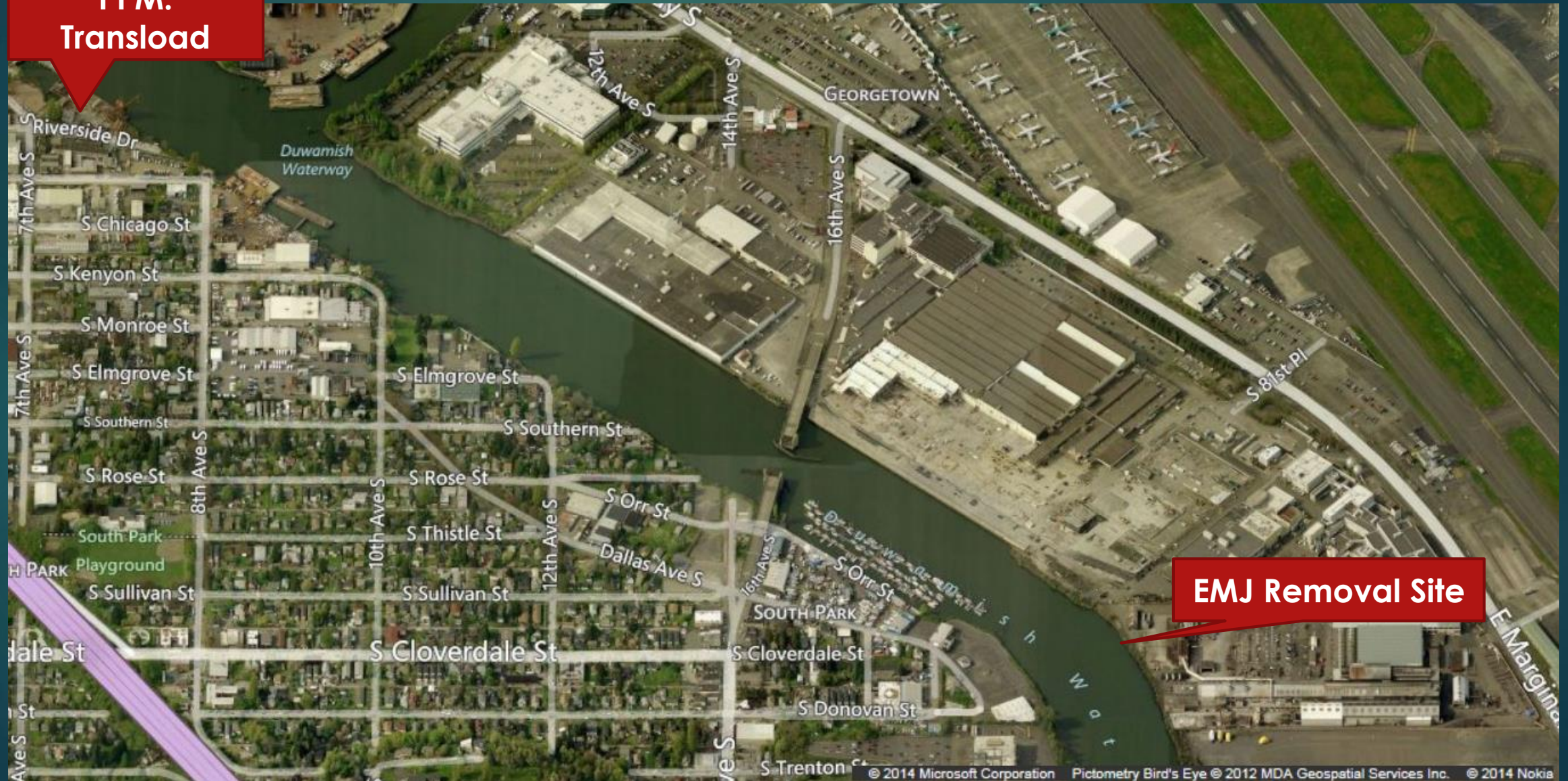
# Removal details and schedule





# EMJ Removal - Moving Materials Off-Site

PPM:  
Transload





# BMPS: Appropriate zones across site





# BMPs:

## Cofferdam for TSCA Material Removal





# BMPs:

## Managing upland materials



# BMPs:

## Environmental bucket





# Unanticipated Issues





# Unanticipated Issues: Moving Material Off-Site





# Additional Lessons Learned

## Communication & Coordination

- ▶ LDW waterway is an active waterway- lots of competing users.
- ▶ There are lots of competing ongoing projects that need to be considered (e.g. the Tunnel) HASP must reflect the hazards that exist on site- exposure to COCs in addition to standard construction HASP.
- ▶ Need clear communication strategy for addressing problems as they arise.

## Cleanups are Environmental Projects

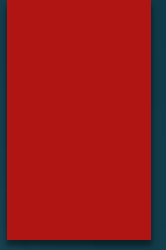
- ▶ Need to consider BMPs to minimize environmental releases of contaminants.
- ▶ Need adequately trained personnel able to respond to environmental releases.
- ▶ HASP must reflect the hazards that exist on site- exposure to COCs in addition to standard construction HASP.



# Questions?

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Updates on other  
early actions:  
Terminal 117

# T-117 – Upland area

- ▶ After extensive rains the last few weeks, the ponding water at the site has not overtopped the waterway side elevated area, but does continue to pond and not drain as designed. The restoration project will correct this issue and until then the site is monitored monthly and after extensive rain events.
- ▶ The Port's contractor is scheduled to finish last year's cleanup work starting December 1, including finishing a small portion of the North bank, installing piles and placing riprap in the southern portion of the site. A pre-construction meeting will be held November 21. A modified RAWP (RA Work Plan) has been approved by the EPA.



# T-117 – Streets / Rights of Way / Stormwater

- ▶ Cleanup work to remove PCBs in dirt beneath roads and installation of a permanent stormwater outfall is expected to begin in April.
- ▶ However, Seattle has pulled the contract for the Streets/Stormwater work when it was determined the bidders were not responsive. The City will re-bid the contract at the end of November and bids will be open (if no delays) in mid- December. We are not sure at this time if this will create a delay in the project, or if efficiencies can be identified to keep on schedule. The Removal Action Work Plan should be developed and finalized by Spring 2015.



# Activated Carbon Pilot Study

KRISTEN KERNS, US ARMY CORPS OF ENGINEERS

# Activated Carbon Pilot Study

- ▶ The Proposed Plan for cleanup of the LDW Superfund Site identifies approximately 48 acres of sediment that meet the criteria for Enhanced Natural Recovery (ENR)
- ▶ The Proposed Plan includes an option to include Activated Carbon in an ENR layer if pilot tests are successful



# Goals of the Activated Carbon Pilot Study

- ▶ Verify that ENR amended with Activated Carbon (AC) can be successfully applied in the LDW by monitoring physical placement success (uniformity of coverage and percent of carbon in a placed layer);
- ▶ Evaluate performance of ENR/AC compared to ENR alone in locations with a range of polychlorinated biphenyl (PCB) concentrations;
- ▶ Assess potential impacts to the benthic community in ENR/AC compared to ENR alone; and
- ▶ Assess changes in bioavailability in ENR/AC compared to ENR alone.

# Study Design

Subtidal, Category 2/3	Subtidal, Category 1 'light'	Intertidal
Enhanced Natural Recovery (ENR)	ENR	ENR
ENR with Activated Carbon (AC)	ENR with AC and scour mitigation	ENR with AC

- ▶ Locations of plots selected based on site specific scour/erosion potential and polychlorinated biphenyl (PCB) concentrations.
- ▶ Each sub-plot will be approximately ½ acre in size in order to allow for sufficient surface area for sampling and so that plots are not influenced by surrounding conditions.
- ▶ Data on baseline conditions will be collected prior to placement of ENR and ENR with AC.

# Study Updates

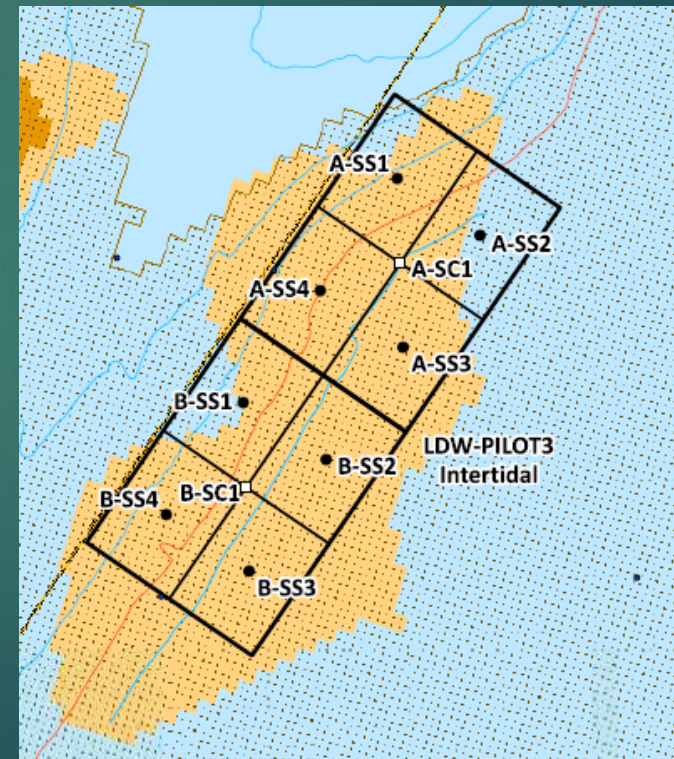
- ▶ Administrative Order on Consent amended on July 17<sup>th</sup>
- ▶ Candidate plots for subtidal, intertidal, and areas of light scour were identified in July and August
- ▶ EPA/Ecology approved QAPP for PCB analysis of candidate plots October 24<sup>th</sup>
- ▶ Sediment sampling was conducted October 27<sup>th</sup> -31<sup>st</sup>
- ▶ Results expected in December. Will finalize plot locations in early January.
- ▶ EPA and LDWG will be coordinating with USACE for plots placed in the navigation channel





# Candidate Plots

- ▶ Intertidal – 3 and 8; 9 backup
- ▶ Subtidal – 4 and 6; 7 backup
- ▶ Light Scour – 1 and 2; 5 backup





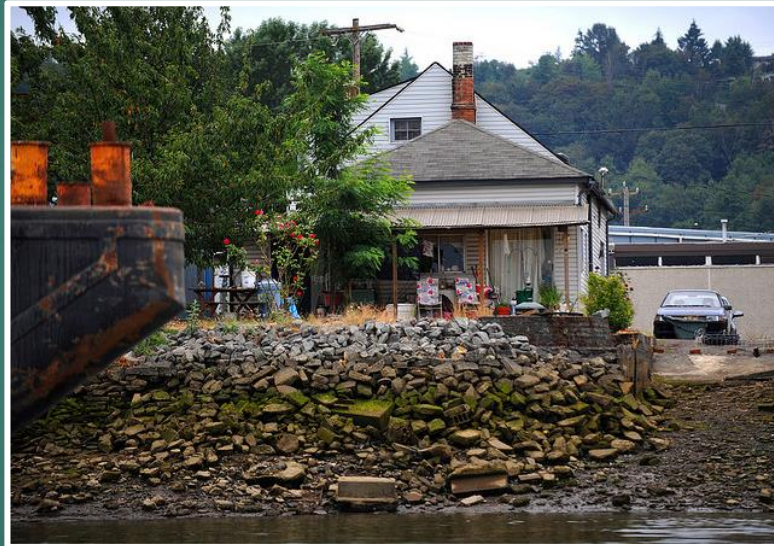
# Sediment Sampling



# Next Steps

- ▶ Results expected in December 2014. Will finalize plot locations in early January 2015
- ▶ EPA and LDWG will be coordinating with USACE for plots placed in the navigation channel
- ▶ Draft design package to EPA expected May 2015
- ▶ Field Implementation scheduled for Winter 2016





# LDW Fishers Study Update

Rebecca Chu, EPA R10



# **Fishers Study:** First step in developing effective and appropriate IC's

- ▶ **Proposed Plan includes “Institutional Controls” to address contaminants in fish**
- ▶ **The EJ Analysis of EPA's Proposed Plan recommends:**
  - the affected community be directly involved in advising EPA on IC development;
  - that enhanced outreach and education programs be developed; and
  - perform periodic seafood consumption surveys to identify what species are being eaten by whom, which may serve as a basis for a more targeted education and outreach program.

# Contamination + Fishers = Fish Advisories





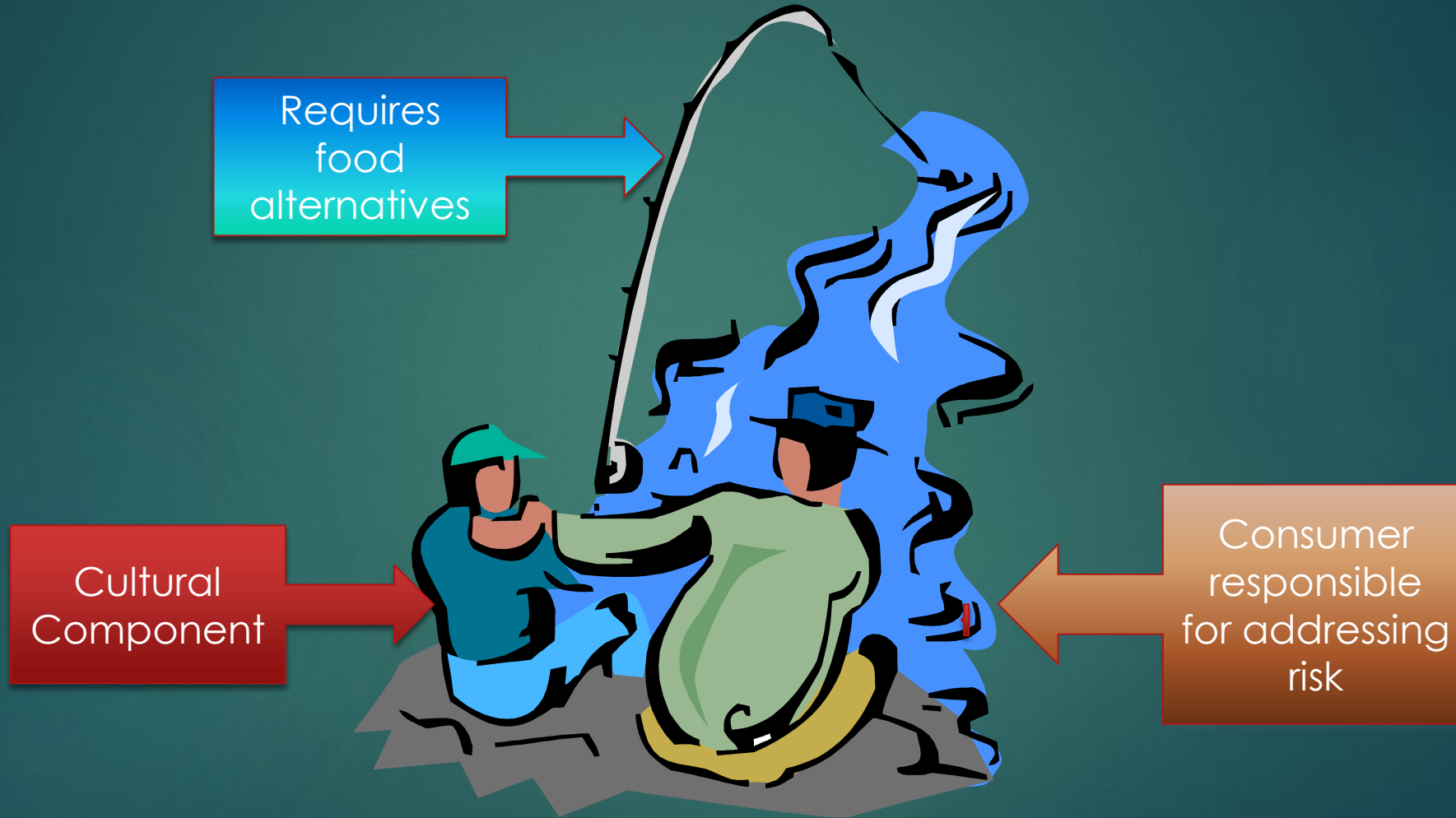
# Do Advisories Work?



Advisory

Crab Pot

# Why don't advisories work?



# Community feedback: Fishing the Duwamish

“Part of culture.”

“Eat and relax with friends.”

“For survival. I fish all of my life from generation to generation.”

“Leisure. To sell and earn extra money. Some people lack the resources to buy from the store.”

“Eat fresh fish, free. I cook fish for my whole family.”

“Eat fresh fish, free. Get away from my kids. Like to Fry and grill seafood.”



Affected groups must be involved as partners or co-managers at every point in the risk communication process. ***This is the single most important lesson that EPA and other agencies should take away from this discussion of effective fish consumption advisories.*** (p. 109)

November 2002 (revised)

## **FISH CONSUMPTION AND ENVIRONMENTAL JUSTICE**

A Report developed from the National Environmental Justice Advisory Council Meeting of December 3-6, 2001



*A Federal Advisory Committee to the U.S. Environmental Protection Agency*



Need to step away from  
traditional research paradigm





# Sounds Good- Let's Do It!

Legally Bound By Order

Lower  
Duwamish  
Waterway  
Group

Tribes

Agency of  
Toxic Substances  
And Disease  
Registry

E.P.A.

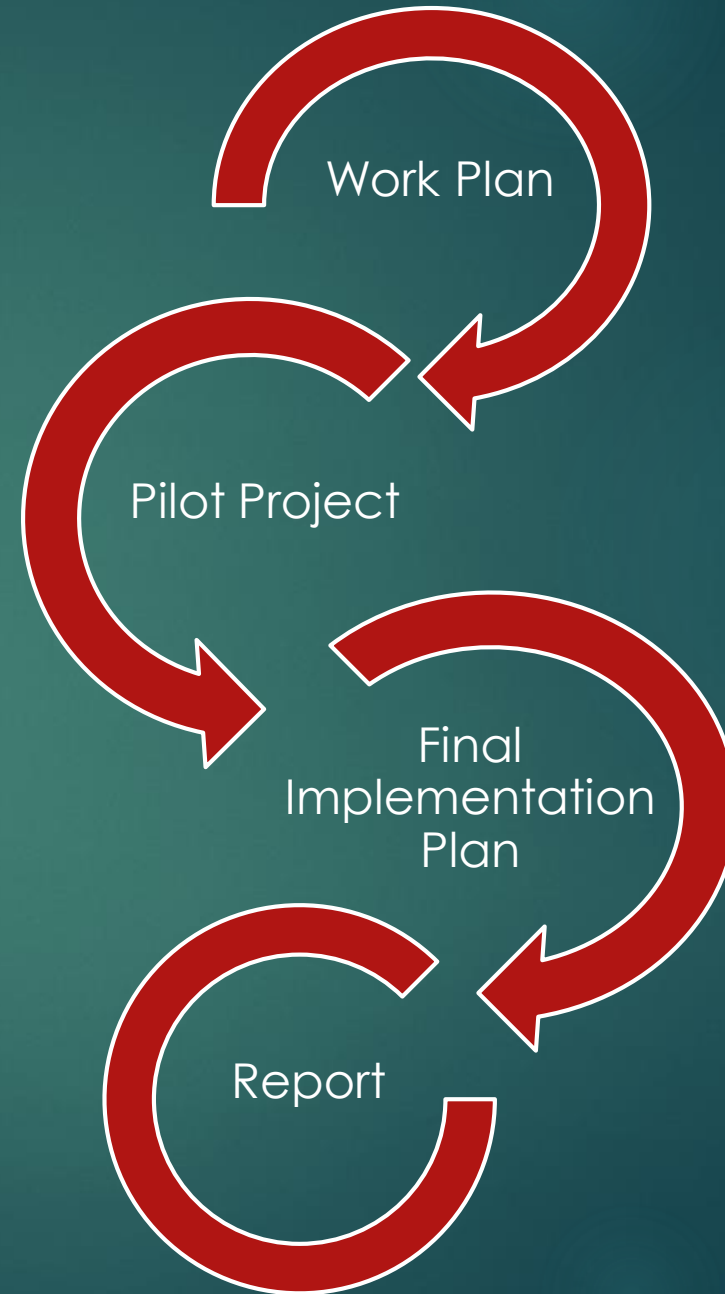
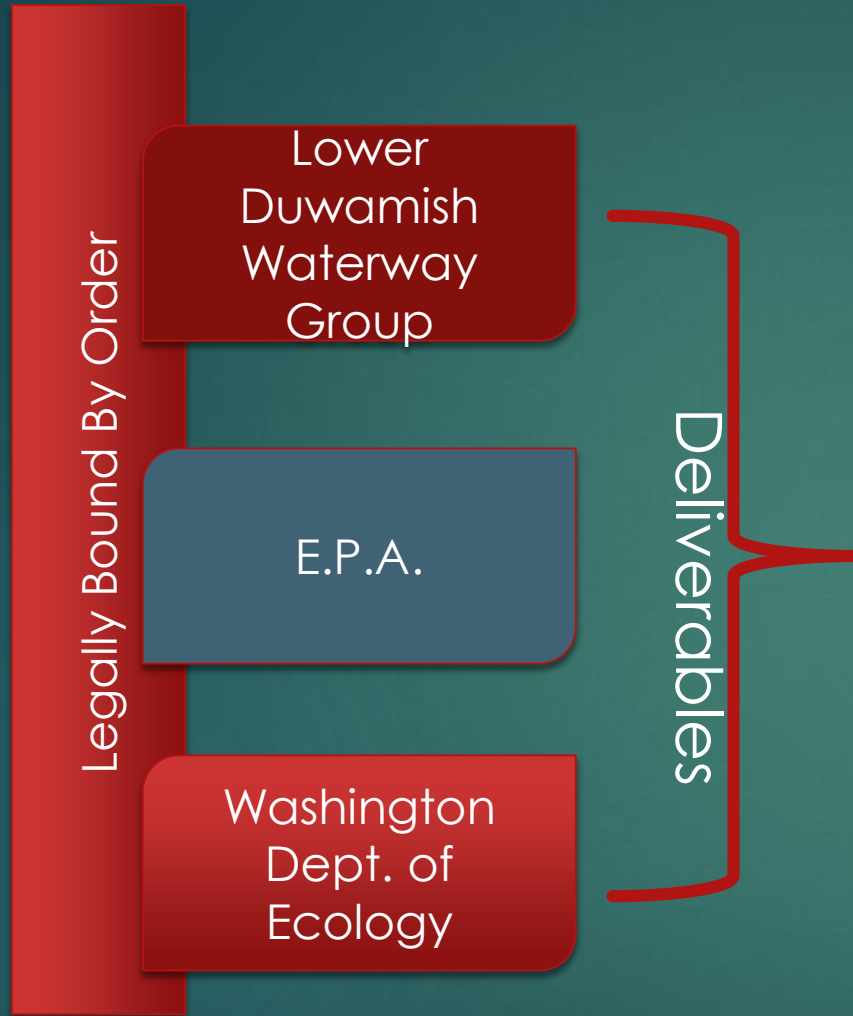
Washington  
Department of  
Health

Washington  
Dept. of  
Ecology

Seattle King  
County Public  
Health

Community  
Groups  
(DRCC/TAG)





# “The Fishers Study”

# Study Questions

- ▶ How is the waterway currently being used for collection and consumption of seafood?
- ▶ What is currently known by the communities about the risks of consuming resident fish/shellfish? ***What are the perceived benefits of consuming seafood from the LDW?***



# Informational Interviews:

## Community Feedback Shapes the Fisher Study



First - Know your target audience

# Community feedback: surveyor appearance



# Community feedback: how communicate in field



맛있다!



# How Fisher Study addressed feedback: Surveyors - Community Experts



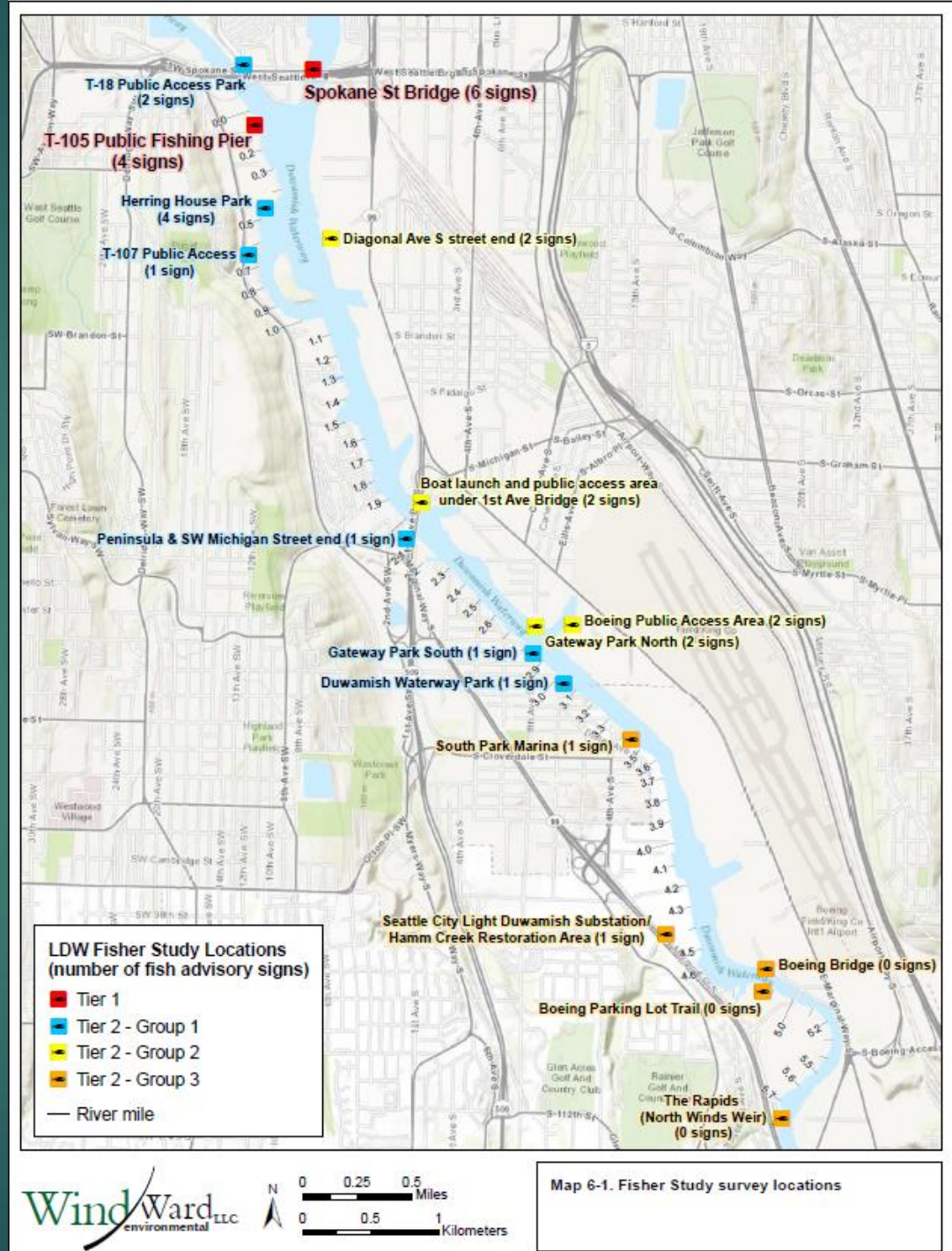


# Community feedback: getting and maintaining participation

Life: one more  
thing!



# Community feedback: incorporated to Study Design



# Community feedback incorporated to Study Design

**Example summer month calendar**

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday		
Week 1		Spokane St. Bridge + G1 (evening)			T-105 + G2 (evening)	Spokane St. Bridge tent (morning)	Spokane St. Bridge + G2 (evening)		
Week 2				Spokane St. Bridge + G3 (morning)		T-105 + G1 (morning)	Spokane St. Bridge + G3 (mid-day)		
Week 3	Spokane St. Bridge + G2 (mid-day)				Spokane St. Bridge + G3 (evening)		T-105 tent (mid-day)		
Week 4			T-105 + G1 (morning)			Spokane St. Bridge + G3 (evening)			
Month Summary Statistics									
	Survey Days	Spokane Street Bridge	T-105	G1	G2	G3	Morning	Mid-Day	Evening
Weekdays	4	3	1	2	1	1	2	1	1
Fridays	2	1	1	0	1	1	0	0	2
Weekends	6	4 (1 tent)	2 (1 tent)	1	1	2	2	2	2
Total	12	8	4	3	3	4	4	3	5

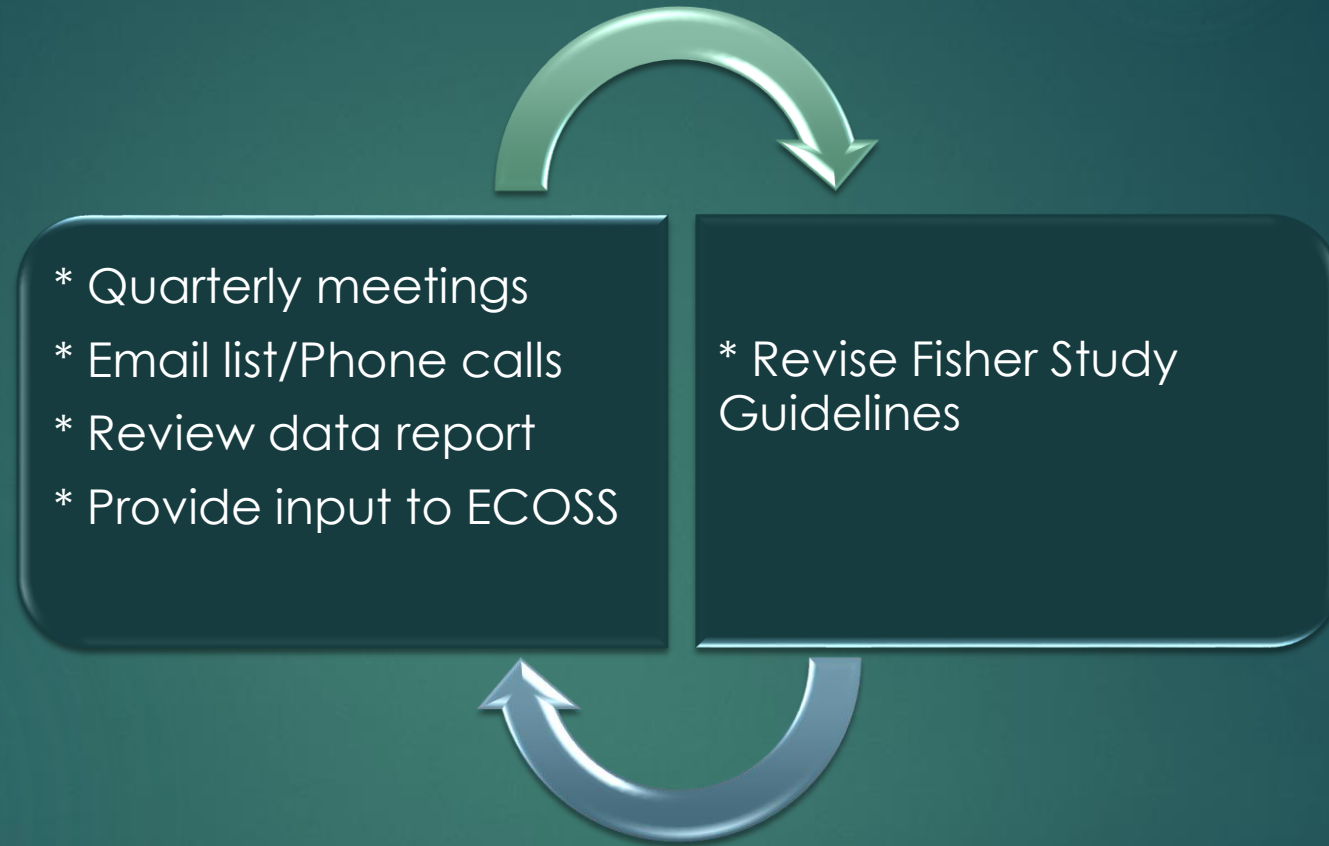


# Community Pilot Testing: Survey Questions

**Table C-1. Summary of feedback from pilot study**

Section/Question	Summary of Feedback from June 24 Training	Summary of Feedback from Pilot Tests	Suggested Revision(s)/Recommendations <sup>a</sup>
<b>Section A</b>			
Introductory text/ consent checkbox	<ul style="list-style-type: none"> <li>Make introduction more conversational and shorter.</li> <li>Make sure to emphasize that ECOSS is a local environmental group.</li> <li>Should include text to reassure people that surveyor is not a game warden (n = 2); don't ask to see fishing license or catch.</li> </ul>	<ul style="list-style-type: none"> <li>This section was clear to participant (n = 6).</li> <li>Surveyor recommended asking participants to save questions about the river until the end of the survey.</li> <li>Surveyor concerned that participant might feel bombarded with too much information (n = 1) and concerned that introduction might take too long to go through (n = 1).</li> </ul>	<ul style="list-style-type: none"> <li>Provide additional surveyor practice and additional training on why this section is needed to help make this text more comfortable/faster.</li> <li>Adjust check box language to clarify that it is about consent and that questions about the river/health/seafood consumption will be answered at the end of the survey.</li> </ul>
Question A1: Have you participated in this survey before?	None	<ul style="list-style-type: none"> <li>No feedback/no problems reported for any of the pilot tests.</li> </ul>	None
General feedback on Section A	<ul style="list-style-type: none"> <li>Need standard answer for when people stop survey part way through (How much is enough?).</li> <li>Make sure people understand why we are doing this survey.</li> <li>Need standard answer for "When is it safe to fish?"</li> <li>Need a way for surveyors to deal with questions asked at the beginning that they have been asked to not answer until the end of the survey.</li> <li>For pilot test, let participants know that it will take 45 min to 1 hour.</li> <li>Some participants may not be familiar with EPA.</li> </ul>	<ul style="list-style-type: none"> <li>Participant suggested that when approaching people, surveyor should begin with a casual conversation, then shake the person's hand before going through original introduction (n = 1).</li> <li>Participant recommended an increase in the value of the \$10 card (n = 2).</li> </ul>	<ul style="list-style-type: none"> <li>Develop FAQ sheet with answers to frequently asked questions for surveyor use in the field. List of questions to be developed based on suggestions in this feedback (see draft list at end of table).</li> <li>Add text to introductory language stating that surveyor is not a game warden and is not there to check fishing license/catch.</li> </ul>
<b>Section B</b>			
Question B1: What are the main reasons you fish?	<ul style="list-style-type: none"> <li>Reason seems obvious to people standing on pier – could be hard for them to summarize (n = 2).</li> <li>People might prefer to say why friends/family fish?</li> <li>Questions B1 and B2 are awkward – hard to describe benefits from specific "spot" vs. general benefits from eating seafood.</li> </ul>	<ul style="list-style-type: none"> <li>Surveyor/participant thinks question is strange/awkward/funny/did not like (n = 4).</li> <li>No feedback/no problems reported (n = 6).</li> <li>Add recreation to the list of reasons.</li> <li>Surveyor felt participant said he was "fishing for fun" because he knew the fish might be polluted (so didn't want to say he was fishing to eat the fish).</li> </ul>	<ul style="list-style-type: none"> <li>Move Question B1 to the end of Section B. Participant dislike for this question and similar questions is addressed by removing Questions B7 and F1 and moving this question to the end of Section B (so that we don't start with a question that was disliked by participants).</li> <li>Add "for fun/recreation" as a response option.</li> </ul>
Question B2: Why do you come to this spot to fish?	<ul style="list-style-type: none"> <li>Seems obvious; may just get answers along the lines of "this is where the fish are."</li> <li>People may want to know why we are asking this.</li> <li>Catching for recreation or catch &amp; release may be more common in other areas of Seattle, but fishers are catching to eat in SW Seattle.</li> </ul>	<ul style="list-style-type: none"> <li>Surveyor felt question seemed a little personal to ask, question was nosy/surprised participant (n = 2).</li> <li>One participant was open and had no problems with the question.</li> <li>No feedback/no problems reported (n = 7).</li> </ul>	<ul style="list-style-type: none"> <li>Move Question B2 to the end Section B (after old Question B1 and before Question C1 about how often people fish). This change creates a more logical flow for the survey.</li> </ul>
Question B3: What are you fishing for today?	<ul style="list-style-type: none"> <li>May be quicker if you give people the table and let them fill it out themselves, or at least let them look at the table.</li> </ul>	<ul style="list-style-type: none"> <li>It will help if participant can look at the table (n = 1).</li> </ul>	<ul style="list-style-type: none"> <li>Do not recommend giving table to participant. Instead, use species picture sheet to prompt participants (particularly since species names may not be familiar to people). Training will cover this procedure.</li> </ul>
Question B4: What have you caught before from this river?	<ul style="list-style-type: none"> <li>Make sure to show pictures; elders don't know species names, and/or names in different languages may not match (n = 2).</li> <li>For B4, fishers like to brag, so they may go back many years regarding what they've caught.</li> <li>Some confusion about whether this question is about just this spot or the entire LDW.</li> </ul>	<ul style="list-style-type: none"> <li>Add shrimp to the species list.</li> <li>Pictures were helpful (n = 3).</li> <li>Participant told a story and this took a while (for B3 and B4) (n = 1).</li> <li>No feedback/no problems reported for either question (n = 4).</li> </ul>	<ul style="list-style-type: none"> <li>Specify that answers to Question B4 are for the past few years.</li> <li>Add shrimp as response option.</li> </ul>





**Ongoing Community Participation -  
Continually Refine Study**

# Is Survey Design effective?

- ▶ To date: *Fishers Study* has a 51 % response rate, with 50+ surveys completed within 6 days it was administered in October.

# Next steps: Informational interviews

**Highest Risk:** Women of child-bearing age,  
pregnant women, children

Signs located where he  
fishes.



But is that info getting back  
here?





# Informational Interviews



# Lessons Learned:

## Fishers Study Development

- ▶ The community are “experts”- need to include them early and often.
- ▶ “Health” is broader than cancer/non-cancer risk- “well being”.
- ▶ Addressing subsistence fishing requires social science- along with engineering.
- ▶ Relationships matter- build trust.
- ▶ Not a “one size fit all” solution for every site.
- ▶ Not a “one size fit all” solution for the fishing community.
- ▶ These are complicated issues-- can't be solved overnight.



# Questions?

